

**DETAILED ACTION**

***Response to Arguments***

1. Applicant's arguments with respect to claims 1, 2, and 4-6 have been considered but are moot in view of the new ground(s) of rejection necessitated by amendment. The USC 112 rejection has been withdrawn due to the amendment.
2. It is important to note that the Pettit (US 2004/0047777 A1) reference is again used in the rejection. Pettit was used in the non-final office action mailed 2/8/10 but the rejection was withdrawn due to the subsequent amendment. Applicant's most recent amendment, however, cause Pettit to again anticipate the claims. Examiner will attempt to address the relevant arguments to Pettit filed on 8/9/10.
3. First, Applicant's assertions on the bottom of page 4 of the Arguments filed 8/9/10 are moot as the Pettit reference is cited in a different manner than previous to reject the claims.
4. Second, Applicant's assertions that the Pettit reference does not disclose coaxial inputs in the direction of the longitudinal axis of the reactor are moot because claim 1 has been amended to read "at least one of said gas flows being fed into said reactor in a predetermined feed direction substantially coaxial to a longitudinal axis of said reactor." Therefore, only one input gas needs to be coaxial to the longitudinal axis of the reactor and Applicant asserts in lines 6-8 of page 5 of the Arguments filed on 8/9/10 that the fuel gas of Pettit fulfills this limitation.

5. Third, Applicant asserts that only the air flow of Pettit is given a swirling motion and not the fuel flow. Again, this argument is now moot, as the claim requires that only one of the oxygen flow or fuel flow is swirled.

### ***Claim Objections***

6. Claims 1, 2, and 4-6 are objected to because of the following informalities: claim 1 recites the limitation "said reator" in line 8. Reactor is misspelled. Appropriate correction is required. Claims 2 and 4-6 depend on claim 1.

### ***Claim Rejections - 35 USC § 102***

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. Claims 1 and 2 are rejected under 35 U.S.C. 102(a or e) as being anticipated by Pettit (US 2004/0047777 A1).

9. Pettit discloses a method of feeding a first gas flow of hydrocarbon fuel (paragraph 20) into inlet **20** in a parallel, coaxial direction to the longitudinal axis **C** of the reactor **10** and a second gas flow of air (comprising oxygen) into inlet **36** (paragraph

25), separate and coaxial from one another for an initial portion of the reactor (between where oxygen enters chamber **500** from **36** and the element **38** in Figure 2); imparting a rotating swirl around the longitudinal axis **C** on the oxygen via swirler **38** (paragraph 27); wherein the oxygen and fuel are mixed downstream of the initial portion (in space **22**) as well as combusted (paragraph 28).

***Claim Rejections - 35 USC § 103***

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

12. Claims 4-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pettit as applied to claims 1 and 2 above.

13. Pettit discloses multiple ports **41** and **410** that are fed with fuel that impart a swirling motion on the fuel (paragraph 50) and parallel to the longitudinal axis **C** and outward of the air and fuel through ports **36** and **20** (see figure 5), but not that they are

coaxial with one another. Pettit does, however, disclose air/fuel countercurrent rotation/mixing (paragraph 51) and that ports **36** and **20** are coaxial to one another for an initial portion of the reactor (between where oxygen enters chamber **500** from **36** and the element **38** in Figure 2). Coaxial or concentric input arrangements allow for compact reactor design (see figure 5). It would have been obvious to one having ordinary skill in the art at the time of invention to form fuel inputs **41** and **410** coaxially with fuel input **20** and the oxygen input of Pettit to allow for a more compact design in Pettit.

### ***Conclusion***

14. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to IMRAN AKRAM whose telephone number is (571)270-3241. The examiner can normally be reached on 10-7 Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Basia Ridley can be reached on 571-272-1453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Imran Akram/  
Primary Examiner, Art Unit 1723